

chambers of the same row do not seem to communicate with each other; but each chamber communicates with two chambers of the previously-formed row, and, in like manner, with two of the subsequently-formed row, by narrow passages, the number and position of which are by no means constant. These passages seem to afford the principal means whereby the segments of the sarcode-body occupying the inner chambers, can be nourished from the exterior; but it is by no means impossible that the tubuli of the shelly laminæ that invest the chambers above and below, may also be subservient to this purpose, since, however numerous may be the laminæ, the tubuli are continued through them all from the cavity of the chamber to the external surface.

The almost entire separation of the segments of the sarcode-body in these two genera, the investment of each of them with its own proper envelope of shell, the minutely-tubular structure and firm consistence of the shell-substance, and the interposition of the intermediate skeleton with its canal-system, are features that place them in such marked contrast with *Orbitolites* and *Orbiculina*, that, notwithstanding their conformity to those two genera in their respective plans of growth, it is scarcely possible for them to be more widely removed in everything that relates to their respective physiological conditions.

From a comparison of the five genera whose structure has been thus elucidated, the author deduces the conclusion that, in this class, external form, which depends exclusively on plan of growth, affords no clue whatever to internal structure; and that the latter alone, as the exponent of the physiological condition of the animal, can afford the basis of a natural classification.

BOTANICAL SOCIETY OF EDINBURGH.

July 10th, 1856.—Professor Balfour, President, in the Chair.

In taking the Chair, Professor Balfour stated that the painful duty devolved upon him of recording the death of the President, Colonel Madden, which took place suddenly and unexpectedly from rupture of the aorta soon after last meeting of the Society. "We all, I am sure (he said), deeply deplore the loss of one who took a warm interest in our proceedings. His amiable deportment and gentlemanly manner endeared him to all of us, and we rejoiced to see one who had spent a large portion of his life in the active service of the East India Company devoting his time and leisure to the prosecution of science. During his residence in India he was a careful observer, and made many interesting remarks on the flora of the country. He sent home the seeds of many valuable plants, which have flowered in Glasnevin and in other gardens. When he came to settle in Edinburgh, he joined the Royal and Botanical Societies, of both of which he became a very active member. He was elected a councillor of the Royal Society, and took a marked interest in its proceedings. He particularly took charge of the scientific additions

which it was agreed to make to its library. To the Transactions of the Botanical Society he contributed an excellent paper on the occurrence of Palms and Bamboos high on the Himalaya, and it is to be hoped that the paper which was read from him at our last meeting will be in such a state as to allow of its publication.

“I have also to report the death of Mr. William Gourlie of Glasgow, who was connected with our Society from its commencement, and aided it much by his exertions. He was a zealous naturalist, and had made a large and valuable collection of plants, which it is hoped will not be lost to science. From his mercantile position in Glasgow, he was able to render important service to this Society and to botanists on many occasions, and he was always ready and willing to do everything in his power for the promotion of science. He set an example of zeal to the mercantile men of the western metropolis, and his labours promised to be instrumental in infusing a taste for science among the community of Glasgow. When the Meeting of the British Association took place in Glasgow in September 1855, he acted as local Secretary. The labour which he underwent, not merely during the Meeting, but for months before, was extraordinary. He spared no pains to render the Meeting creditable to Glasgow, and the arrangements which he made called forth commendation from all. About the time of the Meeting, symptoms of disease of the bones in the face appeared. He endured at first great suffering, which he bore with much fortitude and resignation; and, after a protracted illness, he sunk in the course of last week. He has been taken away in the midst of his usefulness, and at the very time when he seemed to be gaining the highest eminence in his native city. The place which he occupied will not be easily supplied. Let us hope that his enthusiastic love of science, and his noble exertions in the cause of botany, will be the means of stimulating his townsmen to follow his steps; and that, while they are prosecuting their commercial speculations, they will not think it beneath their notice to devote some of their time to science, which was to him in his season of recreation a source of high enjoyment, and which secured for him many friends in all parts of the world. Though dead, may he yet speak to them!”

Professor Balfour read a note from Mr. Babington in reference to Mr. Cock's statement made at a recent meeting, that *Hypericum anglicum* does not grow at Falmouth. Mr. Babington has seen specimens at Falmouth, collected by Mr. Polwhele, and *H. hircinum* grows there also.

The following paper was read:—

1. “A brief Account of the General Botanical Features of a Hill District in Western India, with the results of a Series of Observations in connection with Vegetable Climatology,” by John Kenneth Wilson, Esq.

The hill, or rather mountainous district, upon which I am about to make a few observations, is situated upon an immense mountain-chain which lies parallel with the coast of Western India, and which extends from the Province of Candeish in the north, to Cape

Comorin in the south. This mountain-chain is designated the Western Ghauts. It is situated between isothermal lines which deviate little from their parallels of latitude, and the points of intersection which they form with the meridian. The Ghauts extend over an immense area, included between the parallels of 21° of north and 8° of south latitude.

The particular portion of this district to which I am about to call attention is denominated the Mahabaleshwar Hill district. In this district is situated the source of the river Krishna. Near the head of this river is placed a small Brahmin village named Mahabaleshwar, and a large number of bungalows occupied by European residents. The site of the European bungalows is $17^{\circ} 56'$ north latitude, and $73^{\circ} 30'$ east longitude. The Mahabaleshwar district has been long and deservedly a favourite resort of invalids; the climate being cold, bracing, and elastic, and the scenery around magnificent. The hills of the district rise abruptly by means of terraced trappean steps on their western side from the Province of the Concan, and on their eastern side from the Province of the Deccan. Their general elevation above the level of the sea is 4500 feet, and their highest attainment 4700 feet. Their elevation is much more abrupt and precipitous on their western aspect than on their eastern; the suddenness of their elevation on the western side freely exposing them to the influence of the sea breeze. The hills from top to bottom are trappean and highly quartzose. They are extremely eccentric in their formation, being characterized by great diversity of outline; precipices, ravines, chasms, scarps, woods, and waterfalls abounding on their surface. They are well supplied with water which permeates their surface from streamlets which traverse them in all directions.

In some of the districts at the foot of the hills, I observed the soil increasing from the disintegration of the trap rock, and the native agriculturists selecting for their cereal crops those localities where the greatest amount of disintegration was going on. On the summit of the table-lands, the soil consists of red clay formed by the disintegration of the laterite, a species of cellular ferruginous claystone, which overlies the secondary trap formation, and which constitutes the surface-rock. The soil is very abundant on the lower levels, where it forms a highly productive brown mould, owing to its intermixture with decayed vegetable matter and the debris of the trap rocks; but upon the higher levels the soil is much more scanty and of a redder colour; the rock below it generally existing in the form of superficial or detached masses, hardened and blackened by oxidation from exposure to the air.

On the plains at the base of the hills rest those plants which require the hottest climate, such as the Palms, Banyans, and oleaginous shrubs; the vegetation in this locality being tropical, and similar to that which characterizes the plains of India generally; but upon proceeding from the plains to a more elevated position, a vegetation of a different nature presents itself. The withered grass and scanty stripes of Cocoa-nut trees, and groves of Palms, that afford very inadequate shelter from the scorching rays of a tropical sun, are exchanged for a vegetation of surpassing beauty, richness, and variety,

standing out in marked and vivid relief upon the fantastic terraces and mural cliffs of the surrounding rocks; and consisting of a certain intermixture of temperate with tropical genera, the predominating genera being tropical.

The vegetation is not distributed in equal parallel lines as regards altitude, except when regarded *en masse*, as I frequently found species of genera whose proper habitat was on the hill portions of the district, spreading, extending, and flourishing in the plains during the cold season—the plains being at this season cooled down to a temperature in which they could exist; while again, during the hot season I observed plants whose proper habitat was in the plains, spreading, and diverging into the hill districts. It is probable also that species of tropical hill genera reach not only a much higher altitude, but likewise a much higher latitude, than their representatives on the plains, owing to the less extensive range of the thermometer, greater amount of moisture, and less free radiation, which they possess in their more elevated position.

At the base of the hills, as at that of almost all the other mountains in India, the ground is covered with jungle, at first thin and open, and then becoming marginal, and well-nigh impervious, consisting of shrubs, trees, and high grasses, intermixed with an immense quantity of miscellaneous underwood. The amount of carbonic acid exhaled in the jungle during darkness is enormous; this amount is fostered by the rank and luxuriant vegetation, and by the older vegetation in progress of decay; but fevers are not so prevalent among the inhabitants in this as in other jungle districts, and the approach to the hills is at all times safe, owing to the jungle being cleared in the neighbourhood of the roads. In some parts, at a distance from the roads, it grows, however, so thick, and so thoroughly interwoven with enormous creepers and thorny parasites, as to be rendered perfectly impenetrable. Among the jungle trees, I observed as typical of this district the occurrence of *Grewia Asiatica*, *Combretum ovalifolium*, *Nauclea Cadamba*, *Carissa Carandas*, *Grislea tomentosa*, and also of several species of *Celastrus*, *Zizyphus*, *Cordia*, and *Sterculia*.

When mentioning the occurrence of the *Sterculiaceæ*, I may state that in the Province of the Concan I had an opportunity of examining that rare tree, the *Adansonia digitata*, with its immense stem, large flower, and enormous fruit. There is every reason to believe, as Roxburgh has shown, that this tree, although indigenous in Africa, is yet an exotic in India. It is one of the largest trees in the world, and is supposed to exceed any other in longevity. In several specimens which I examined, I never could find the occurrence of any such annular rings as would be necessary to prove the very great longevity generally attributed to this tree. Professor Lindley has in a most excellent manner shown the true value of calculations regarding the age of this tree. The natives use the pulp of the fruit, which affords a pleasant acid, as a medicine, and as the basis of a sort of sherbet, very grateful to patients suffering from febrile complaints. The young leaves are eaten as food, and the fibres of the wood are put to a variety of useful purposes.

The humid vapoury atmosphere which pervades the jungle shades,

under the massive bowers of foliage so gigantic, is most favourable to the growth and spread of Fungi, Lichens, and other Cellulares; accordingly, in this locality they abound everywhere.

In some portions of land cleared of jungle by the native agriculturists, I observed many fruit-trees flourishing in cultivation, such as the Mango (*Mangifera Indica*), Custard Apple (*Anona squamosa*), Plantain (*Musa paradisiaca*), Pomegranate (*Punica granatum*), &c. In several small plots of cultivated ground, likewise recovered from the jungle, I observed Rice, Sugar Cane, Bamboo, and other useful plants, growing and flourishing in apparent abundance, and associated with cereal grains, such as *Holcus Sorghum* (joaree) and *Holcus spicatus* (bajree).

On ascending the mountain slopes, and after emerging from the jungle, the vegetation again becomes changed. At first the change is slow, but at length it becomes well marked and decided. The underwood becomes less abundant, and the trees stand forth in more solitary grandeur and in greater relief, the varied colouring of our autumnal foliage being absent among them, but this absence being more than compensated for by the richness of their verdure, the contrast of their forms, and the gracefulness of their proportions. Mosses of various descriptions and beautiful Lichens clothe the rocks, while Grasses of great variety and fantastic appearance are met with in abundance. Arums and Euphorbias now become prevalent. In addition to the rarer trees and shrubs already enumerated as occurring in the jungle, I observed as typical of this district—which district may be designated that of the slopes—the presence of the *Bridelia montana*, *Pentaptera paniculata*, and *P. tomentosa*.

In continuing in an altitudinal direction, the ascent of the hills becomes suddenly very abrupt, the trap rock being now thrown up in most places into immense terraces, crowned by table-lands, and flanked by high and precipitous cliffs. On these table-lands forest trees are generally absent; but forest trees occur here and there. The whole surface of the table-lands is, however, strewn over with large tree shrubs and plants of great variety. The *Calyptrothrix caryophyllifolia* or Jambool tree is very characteristic of this district. The *Olea dioica*, *Terminalia Chebula*, *Symplocos racemosa*, *Memecylon ramiflorum*, and the Water-tree or Oomber (*Ficus glomerata*) occur very frequently. *Urtica pulcherrima*, *Rubus rugosus*, a species of *Salix* (the *tetrasperma* of Roxburgh), *Eriolaena Hookeriana*, and *Pygeum acuminatum* occur here and there.

[To be continued.]

ZOOLOGICAL SOCIETY.

November 27th, 1855.—Dr. Gray, F.R.S., in the Chair.

NOTE ON THE GENUS *LEGRIOCINCLUS*, LESSON, AND ITS SYNONYMS. BY PHILIP LUTLEY SCLATER, M.A. ETC.

In his last published work on natural history, entitled 'Description des Mammifères et Oiseaux,' which is part of the series known as